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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/486,784	03/01/2000	RALF DONNER	4797-8PUS	2441

7590 07/18/2005

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EXAMINER	
RIDLEY, BASIA ANNA	
ART UNIT	**PAPER NUMBER**
1764	

DATE MAILED: 07/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Interview Summary	Application No.	Applicant(s)	
	09/486,784	DONNER ET AL.	
	Examiner	Art Unit	
	Basia Ridley	1764	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Basia Ridley*. (3)_____.

(2) *Alfred Froebrich (Reg. No. 38,887)*. (4)_____.

Date of Interview: *14 July 2005*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *7*.

Identification of prior art discussed: *Gudymov et al. (DE 3,523,610 and FR 2,569,827)*.

Agreement with respect to the claims f)☐ was reached. g)☐ was not reached. h)☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

BASIA RIDLEY
PRIMARY EXAMINER

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

S.00

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)
In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The applicant argued that the pressure shell of the instant invention is different from the pressure shell of Gudymov et al. (as defined in the rejection) because the pressure shell of the instant invention absorbs the difference in pressure between the reaction chamber and the outside atmosphere (see specification, page 5, lines 23-26), while the "pressure shell 2,4,6" of Gudymov et al. is part of the internal lining of the reactor and is surrounded by another, outer pressure wall, not shown in drawings. The examiner indicated that while instant claims do not require the pressure shell to absorb the pressure difference between the reaction chamber and outside, amending the claims to include said limitation would not distinguish between the instant invention and Gudymov et al., because the water cooling gap of Gudymov et al., in addition to being defined between the cooling wall (1,3,5) and pressure shell (2,4,6), is also defined between the cooling wall (1,3,5) and any pressure shell surrounding the wall (2,4,6). Further defining the water cooling gap as being defined by the cooling wall and the pressure shell absorbing the difference in pressure between the reaction chamber and the outside atmosphere would appear to overcome the rejection of record. Adding said limitation would require further consideration and/or search.

Upon applicant's request, attached is translation of the Gudymov et al. reference.

PTO 03-4539

German Patent No. 3,523,610 A1
(Offenlegungsschrift)

COOLING SHIELD AS INSIDE LINING FOR THE REACTION CHAMBERS OF FURNACES

Ernest Gudymov, et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. JULY 2003
TRANSLATED BY THE RALPH MCELROY TRANSLATION COMPANY

FEDERAL REPUBLIC OF GERMANY
GERMAN PATENT OFFICE
PATENT NO 3,523,610 A1
(Offenlegungsschrift)

Int. Cl.[2]:	F 23 M 5/08
Filing No:	P 35 23 610.8
Filing Date:	July 2, 1985
Laid-Open to Public Inspection:	March 13, 1986
Priority	
Date:	September 4, 1984
Country:	East Germany
No.:	WP C 10 J/266 957 4

COOLING SHIELD AS INSIDE LINING FOR THE REACTION CHAMBERS OF FURNACES

[Gekühlter Schirm als Innenauskleidung für die Reaktionsräume von Feuerungsanlagen]

Inventors:	Ernest Gudymov, et al.
Applicant:	Brennstoffinstitut Freiberg

Examination request has been filed in accordance with Section 44, Patent Law.

Claims

1. Cooling shield as an inside lining of combustion chambers, gas producers and the like, consisting of a cooled jacket with rods affixed there and a inside layer of refractory monolithic lining material, characterized in that the cooled jacket is delimited by two equidistantly arranged, flat plates (1,2) and/or lengths of pipe (3,4; 5,6), which are connected to one another by means of continuous support bolts (7).

2. Cooling shield according to Claim 1, characterized in that at the inside plates (1) and/or lengths of pipe (3,5), additional rods (8) are affixed, gasproof, whose inside end sections are embedded in the single-layer lining material (19), just like the inside sections of the support pegs (7), and whose outside sections protrude into the cooling space between the continuous two plates (1,2) or lengths of pipe (3 to 6), which receive a throughflow of the cooling agent.

3. Cooling shield according to Claim 1 or 2, characterized in that the support bolts (7) or /2*
the rods (8) are welded in boreholes in the plates (1,2) or the lengths of pipe (3 to 6).

4. Cooling shield according to Claims 1 to 3, characterized in that the outside or the inside conical and cylindrical lengths of pipe (3 to 6) are connected to one another, gasproof, by an outside and an inside continuous jacket, wherein the hollow, cylindrical inside space between the two jackets is connected with a lower and upper annular collector (10,12) for the supply and discharge of the cooling agent.

The invention concerns a cooled shield as an inside lining for the thermally highly stressed fuel or reaction chambers of furnaces, gas generators, and the like, and can be used in /3
the chemical industry, in particular, with gas producers with liquid slag removal and relatively large hydrogen sulfide contents in the generator gas.

From DE-OS 2 555 466 (Cl. C10J 3/76, 3/86; 1977), a cooling shield or an inside lining is known for a gas producer with liquid slag removal, which has a cooling surface formed from pipes. The pipes are welded with one another, gasproof, via gasproof crosslinks, and the pipe walls are lined with a ceramic material applied by means of plasma or a flame. Over it, there is a cover composition, which is held by a dense wire network, welded onto the crosslinks. This /4
known lining has substantial disadvantages. In particular during starting and initiating processes, the ceramic cover is loosened from the pipe walls and the cover composition falls, together with the ceramic material into the molten slag. Gas gaps, namely, are formed between the water-cooled pipes and the ceramic cover, which impair the intensive heat transfer and thus the desired and needed cooling. The dense wire network can melt, which leads to large-area ruptures in the refractory material on the reactor walls and in particular, in the area of the reactor cover.

According to SU-Inventor Certificate 270 948, another cooling shield of the indicated type for a furnace chamber with central removal of the molten slag belongs to the state of the art, in which a cooling jacket is formed from pipes welded to one another, gasproof, via crosslinks. Rods are welded onto the pipe surfaces and a refractory single-layer lining material is located above and between the rods. Also this cooling shield with rods has an operating reliability and service life, which are too low in practice, when used in a unit for the gasification of coal dust with liquid slag removal, because very high specific heat flows and the high hydrogen sulfide concentrations in the gases produced attack the wall construction. The rods welded onto the cooled pipe surface conduct the heat absorbed over its front surface and its lateral surfaces only via the welded site into the pertinent cooling pipe. These welding sites have increased thermal /5
resistances, however. Since the length of the rods also cannot fall below certain limiting values, which are prespecified by the clamping of the rods in the welding machine and/or by other

* [Numbers in the right margin indicate pagination of the original language text.]

welding conditions and also, since the surface fraction of the inside surface of the generator space to be cooled, which is carried out by the rods, is very limited, the intensity of the heat removal by the combustion chamber surface to be cooled is relatively small. These circumstances can lead to overheating of the free rod ends with the result of an excessive H_2S corrosion and a melting of the free rods. The heat flow to the pipe surface rises so that the pipes are overheated and fail. Furthermore, there are excessive heat stresses of individual or less special pipes, in comparison to the other cooling pipes, which, in particular with a weakening of the rods due to melting or corrosion, leads to the boiling of the cooling water in the pipe or to a surge of a vapor-water emulsion used as a cooling agent. The resistance of these pipes increases and the cooling agent supply is correspondingly reduced or even interrupted. The vapor bubbles formed in the pipe can fill out the entire pipe cross-section and clog the affected pipe. The cooling effect and the heat removal in the cooling agent is thereby very greatly limited and the pipe burns through.

The goal of the invention is to increase the operating reliability and service life of a furnace, or the like, with partial oxidation of fuels under pressure, in particular gas generators with the partial oxidation of fuels under pressure and with a high H_2S content in the produced /6
generator gas, while avoiding the disadvantages of the state of the art.

With a cooling shield with rods, which has cooling channels and rods and a refractory single-layer lining material, this goal is attained, in accordance with the invention, in that the cooling channels or spaces, which receive a throughflow of cooling agent, are delimited by two plates or two axis-parallel lengths of pipe, which are connected to one another by continuous support bolts, wherein additional rods are provided in the inside plates and/or lengths of pipe, which protrude into the cooling space delimited by plates and/or lengths of pipe.

With such an embodiment of cooling shields, a better operating reliability and longer service life result because the heat transfer to the cooling agent is made uniform and intensified. The continuous cooling spaces, delimited by the plates or lengths of pipe, effectively prevent the formation of cloggings due to the formation of vapor, because vapor bubbles which may form can rise in the cooling agent. The support bolts, which pass through the two plates or lengths of pipe, and the additional rods on the inside plates or lengths of pipe bring about a destruction of the forming larger vapor bubbles and prevent the formation of vapor drops and overheating of the inside plates or lengths of pipe. Since the additional rods extend through the inside walls and protrude transversely into the individual cooling space, there is a substantially more intensive /7
direct heat release to the cooling agent which preferably flows transversely to them. Another intensification is also produced by the enlarged heat transfer surface of each support bolt and rod.

The table gives the cooling surfaces with the same degree of provision of rods of approximately 25% for a cooling shield made up of pipe coils and for a cooling shield formed

from plates and or lengths of pipe of approximately 30 mm intervals, wherein the rod diameter is 10 mm.

Table

	Pipe coil- cooling shield	Cooling shield made of equidistant plates or lengths of pipe
Cooling surface of the rod mm^2	0	942
Area for one rod, mm^2	312.5	234
Total cooling area, mm^2	312.5	1176

Finally, there is a substantial reduction of the thermal resistance during the heat transfer by the conduction of heat along the rod and further to the cooling agent, in that the main fraction of the heat--more than 80%--is directly transferred from the rod to the cooling agent and only a small part of the heat is transferred to the cooling agent via the welding site between the circumferential /8
surface of the rod and the wall of the plate or length of pipe.

The use of the support bolts, which go through the inside plate or the inside length of the pipe, make possible an enlargement of the effective length of the rods, projecting on the side of the reaction chamber. This length can be selected as a function of the beginning of the strong hydrogen sulfide corrosion at approximately 350 to 400°C, so that in this way, a corresponding service life of the rods is guaranteed.

A preferred embodiment of the invention is shown in the drawing and is described more precisely in the following. The figures show the following:

Figure 1, a cooled inside jacket or a cooling shield of a gas producer in the longitudinal section;

Figure 2, a section of the cooling shield on an enlarged scale.

The depicted cooling shield with rods according to Figure 1 forms the lining construction of a shaft-shaped reactor, as it is used, for example, for the production of a generator gas and/or for the pressure gasification of coal dust and other ash-containing fuels with relatively high sulfur contents. The cooling shield comprises a double jacket, which continuously receives a /9
throughflow of the cooling agent and which, in the form of two equidistantly arranged plates 1, 2, is constructed, in the lid area, by cylindrical lengths of pipe 3, 4 and conical lengths of pipe 5, 6, adjoining them. The plates 1, 2 or the lengths of pipe 3, 5; 4, 6, which are at equal distances from one another, are connected with one another by two support rods 7, which pass through, and are kept at the prespecified distance. The inside plate 1 in the lid part and the inside lengths

of pipe 3, 5 are provided with additional shorter rods, whose ends protrude into the cooling agent space between the plates 1 and 2 or between the lengths of pipe 3 and 4 and 5 and 6. The support rods 7 and the rods 8 are welded to the plates 1, 2 or to the lengths of pipe 3 to 6 via circumference weld seams 9, as is especially depicted in Figure 2.

At the lower drawn-in end part of the reactor, an annular collector 10 is provided, in which the cooling agent, supplied via a connection 11, discharging therein, is uniformly distributed over the entire circumference and in free flow connection with the cooling agent space between the lengths of pipe. Another annular collector 12 with a discharge connection for the cooling agent (water or vapor-water emulsion) is provided at the upper end part of the reactor and is also connected with the cooling spaces delimited by the lengths of pipe. The lid part, formed from the plane plates 1 and 2, is incorporated into the opening of the annular collector 12 and has a central opening for a burner 14. This lid part has its own annular collector 15 with connecting branches 16 for the cooling agent supply and another annular collector 17 with a water discharge connection /10
18, wherein the annular collectors 15, 17 are arranged on the radial inside edge or outside edge of the plates 1,2.

The support bolts 7 and the rods 8 project, in a suitable length of, for example, 8 to 15 mm, beyond the inside plate or the inside pipe pieces 3, 5 at the side of the reaction chamber. On these free end sections of the support pegs and rods, the refractory single-layer lining material 19 is affixed in a prespecified layer thickness. The support bolts have not only the goal of affixing the single-layer lining material and the heat removal, but they form, moreover, stiffening and supporting elements, which connect the surface 1, 2 and the lengths of pipe 3, 4 or 5, 6 to form a construction unit, which is, in fact, dimensionally rigid, and which permits working with a high pressure.

A cooling shield constructed in accordance with the invention works as follows:

Water or another suitable cooling agent is supplied, in continuous flow, to the annular collectors 10 and 15, via the connections 11, 16; the cooling agent flows into the cooling spaces delimited by the plates 1 and 2 or the lengths of pipe 3, 4, and 5, 6 and thereby intensively rinses the support bolts 7 and the projecting rods 8. The heated cooling agent is collected in the annular collectors 12 or 17 and removed via the connections 13 or 18.

The salt-containing fuel (coal dust) and the oxygen-containing gas, for example, a /11
mixture of technical oxygen and water vapor, arrive in the reaction chamber delimited by the cooling shield, through the burner 14. The temperature in the reaction chamber is kept above the temperature of the normal liquid slag removal, wherein the ash particles contained in the fuel are melted and at least partially settle on the inside surface of the single-layer lining material 19, cooled via the support bolts 7 and the rods 8. A slag layer of a thickness that is usually 1.5 to 3

mm forms on this inside surface of the single-layer lining material 19; the striking liquid slag flows onto this slag layer, without coming into contact with the single-layer lining material 19, so that it cannot be dissolved either. The flowing-off slag melt collects in the lower part of the reaction chamber and is removed by a slag discharge body (not depicted), which is installed within the annular collector 10. The heat from the single-layer lining material 19, which is removed via the support bolts 7 and the rods 8, is released to the circulating cooling water, which is thereby heated and can begin to boil when the cooling shield is laid out for a cooling with vapor-water emulsion. The hot water or the vapor-water emulsion is collected in the annular collectors 12 or 17 and removed through the connections 13 or 18.

The cooling shield, constructed in accordance with the invention, permits an increase in the temperature in the reaction zone of a gas generator by 300 to 500°C and at the same time, a limiting of the maximum temperature of the bolts or rods to 350 to 400°C--by a shortening of the /12
rod length and by the better cooling effect of the system. Cloggings of cooling channels due to vapor bubbles are ruled out, wherein the important operating reliability of the reactor is considerably improved.

The invention is not limited to the depicted embodiment. Thus, for example, the cylindrical and the conical pipe pieces can have a special cooling system with corresponding annular collectors and supply and removal connections for the cooling agent. Moreover, the additional rods in the thermally less stressed sections of the cooling shield can be provided in a reduced number or in the extreme case, can also be omitted. Finally, these rods 7 can also be affixed by other types of affixing, such as shrinkage or pressing in the inside wall of the pertinent cooling space, as long as they only guarantee the pressure-proof quality of the connection.

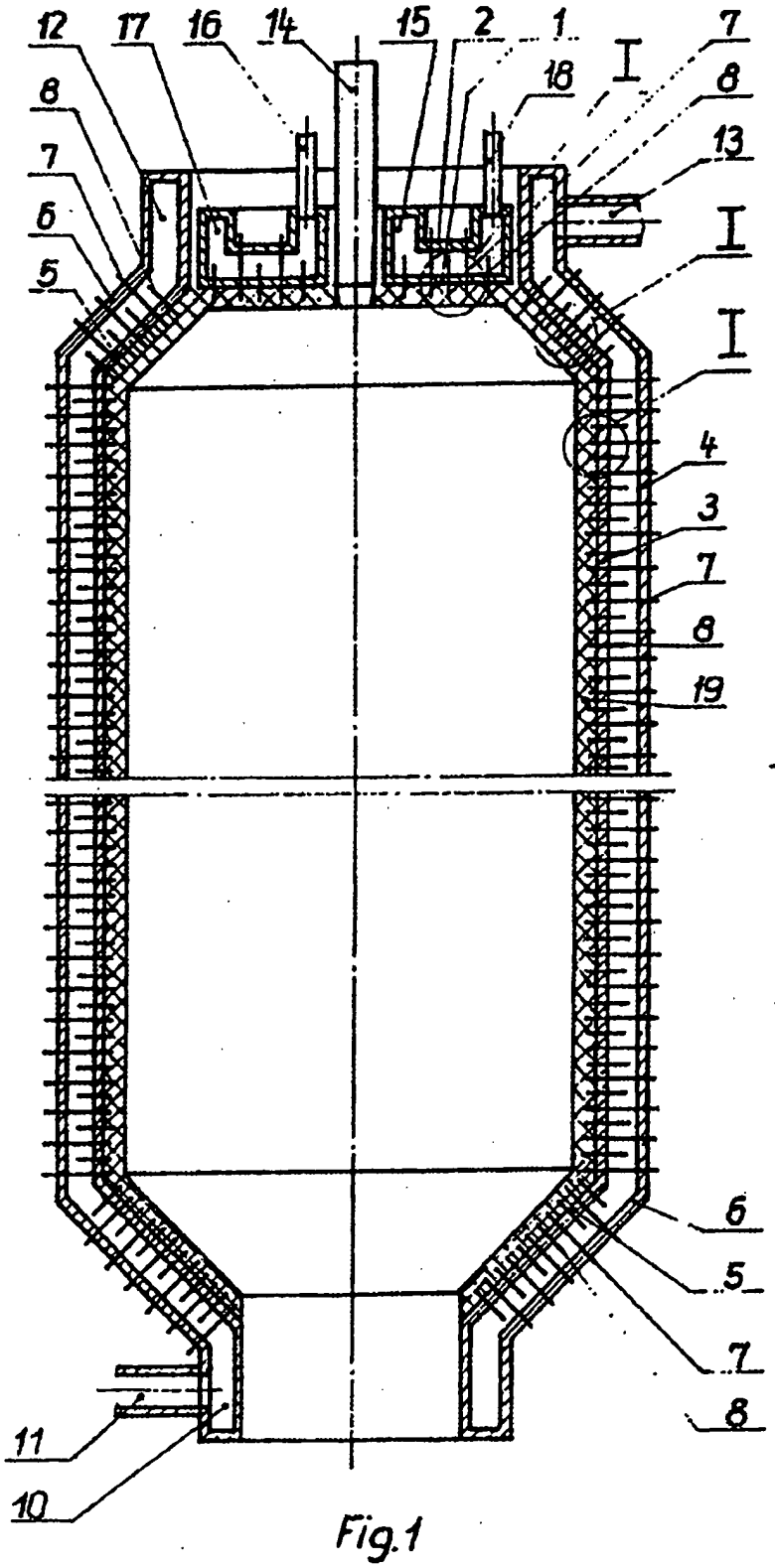
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Fig.1

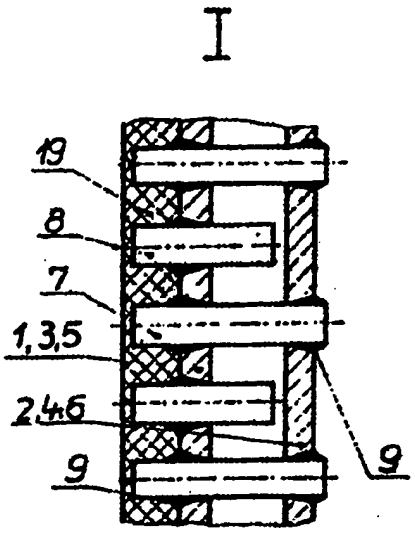
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Fig.2